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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/724,314	11/26/2003	Bharath SV Kumar	140275-1	2929

6147 7590 04/17/2008

GENERAL ELECTRIC COMPANY
GLOBAL RESEARCH
PATENT DOCKET RM. BLDG. K1-4A59
NISKAYUNA, NY 12309

EXAMINER	
MOTSINGER, SEAN T	

ART UNIT	PAPER NUMBER
2624	

NOTIFICATION DATE	DELIVERY MODE
04/17/2008	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

ldocket@crd.ge.com
rosssr@crd.ge.com
parkskl@crd.ge.com

Office Action Summary	Application No.	Applicant(s)	
	10/724,314	KUMAR ET AL.	
	Examiner	Art Unit	
	SEAN MOTSINGER	2624	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *15 January 2008*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-3,5,8,9,12 and 15-22* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-3,5,8,9,12 and 15-22* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *26 November 2003* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

Response to Applicants Arguments

1. Applicants arguments /amendments filed on 1/15/2007 have been entered and made of record and are considered below.

2. Regarding the rejections under 35 U.S.C. 112 applicant has amended or cancelled the affected claims to overcome the problems.

3. Regarding the rejections under 35 U.S.C. 103 of claims 1-3, 5, 8-9, 12, 15-22 applicants arguments are considered but are not persuasive. Applicant argues that the combination of Li, Gu and Dekel do not disclose all of the claimed features. Applicant argues that "The Gu reference merely discloses DPCM in the x and y direction" and does not disclose "DPCM on a group of axially transformed representations to generate a spatially transformed representation of the axially transformed representation" nor a first and second resolution. Applicant is arguing that none of the references disclose this step. However this is a piecemeal argument while no single reference teaches these three elements the combination of Li and Gu does. Applicant has not disputed that Li discloses performing an axial wavelet transformation to generate an axial wavelet transformed representation. Gu clearly discloses performing DPCM transformation on a wavelet transformed representation (see rejection below).

4. Applicant is correct in saying Gu does not disclose that that DPCM creates a second spatial resolution lower then the first. DPCM by itself does not alter

resolution. However the combination of Li and Gu teaches performing both a wavelet transform in the x and y direction (Li) and DPCM (Gu). The combination of both transformations will create a representation having second spatial resolution lower then the first spatial resolution through the wavelet transform. The claim clearly does not prohibit performing both operations as both operations are claimed in claim 12. Furthermore if another operation other then DPCM could not be preformed along with DPCM in this step; the specification would not be enabling, because DPCM alone is incapable of creating a lower resolution representation. Adding DPCM of Gu to Li in the above is a very well known simple modification with a clear motivation as DPCM would further compresses the data of Li.

Objections to the Specification

5. The specification is objected to as failing to provide proper antecedent basis for the claimed subject matter. See 37 CFR 1.75(d)(1) and MPEP § 608.01(o). Correction of the following is required: As presently claimed in claim 1 "performing a differential pulse code modulation…to generate a spatially transformed representation...the spatially transformed representation having a second spatial resolution lower then the first resolution. The specification does not describe DPCM which creates a lower resolution and therefore this claim feature lakes antecedent basis in the specification. The specification describes performing a wavelet transformation to generate a spatially transformed representation, or performing DPCM to generate a spatial transformation. However, of the two, only wavelet

transformation results in the spatially transformed representation having a second resolution lower then the first. DPCM is merely a method of representing a pixel by the difference between the pixel and a prediction of the pixel values based on prior pixel values. Performing DPCM itself has no effect on resolution. Claim 12 also has this issue, it claims performing both wavelet and DPCM, however the specification does not disclose performing both wavelet and DPCM only one or the other.

Rejections Under 35 U.S.C. 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

6. Claims 1-2, 5, 8-9, 12-16, 18, and 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Li et al US 6,567,081 in view of Gu et al. US 7,006,568.

7. Re claim 1 Li discloses a method of processing image data comprising: receiving data indicative of a group of consecutive cross sectional images (see column 10 lines 20-23 figure 10 note the consecutive cross sectional images shown in figure 10), of a three dimensional volume being imaged (see column 10 lines 20-23), each of the cross sectional images being perpendicular to a z-axis (x axis 29-32 note the x-axis in this case is described as axis along which frame lifting is taking place i.e. is

the axis which is prependicular), the group of consecutive cross sectional images having a first axial resolution in a z-axis direction (note there must be some resolution in this direction) and having a first spatial resolution in x-axis (z axis) and y-axis (column 10 line 30) directions orthogonal to the z-axis (figure 11 note the x and y axes are orthogonal); and transforming (wavelet decomposition column 10 line 32) the group of consecutive cross sectional images in the z-axis (x-axis column 10 line 35) direction to generate an axially transformed representation of the group (column 10 line 35), the axially transformed representation having a second axial resolution lower than the first axial resolution (column 9 lines 28-31 note that wavelet transform can provide reduced resolution representations).

8. Performing a wavelet transform (column 10 lines 25-40) on the axially transformed representation in x-axis and y-axis directions (y,z plane column 10 lines 35-38) to generate a spatially transformed representation (note y and z are clearly spatial dimensions) of the axially transformed representation (column 10 lines 35-38), the spatially transformed representation having a second spatial resolution lower than the first spatial resolution (column 9 lines 28-31 note that wavelet transform provides reduced resolution representations).

9. Li does not disclose also performing differential pulse code modulation with the wavelet transform in x-axis and Y axis direction. Gu discloses DPCM with the wavelet transform in x-axis and Y axis direction (column 14 lines 15-20.) The motivation to combine is “encode these signals with the lowest possible bit rate” (column 1 lines 50-55)

10. Re claim 2 Li further discloses generating reconstruction data (compressed data see abstract) to allow reconstruction (decompression see abstract) of the group from the axially transformed representation.

11. Re claim 5 Li further discloses performing entropy encoding of the axially transformed representation (see figure 3 element 308).

12. Re claim 8 Li further discloses providing the spatially transformed representation (compressed image see abstract and figure 1) to a viewer (note the representation is decompressed and displayed see abstract and figure 1) and progressively providing information to allow reconstruction of the spatially transformed representation (Progressive reconstruction column 17 lines 5-15)

13. Re claim 9 Li further discloses performing entropy encoding of the spatially transformed representation (see figure 3 element 308).

14. Re claim 12 Li discloses method of processing image data comprising: receiving data indicative of a group of consecutive cross sectional images (see column 10 lines 20-23 figure 10 note the consecutive cross sectional images shown in figure 10), of a three dimensional volume being imaged (see column 10 lines 20-23), each of the cross sectional images being perpendicular to a z-axis (x axis 29-32 note the x-axis in this case is described as axis along which frame lifting is taking place i.e. is

the axis which is perpendicular); transforming (wavelet decomposition column 10 line 32), in one dimension, a plurality of the images in a z-axis direction (x-axis column 10 line 35) to generate a first transformed representation of the three dimensional volume wherein the transforming in one dimension comprises at least one level of wavelet decomposition (wavelet decomposition column 10 line 32); and transforming (wavelet decomposition column 10 lines 30-27), in two dimensions (yz plane column 10 lines 36 and 37)), the first transformed representation in an x-axis (z axis) direction orthogonal to the z-axis (x axis) direction and a y-axis (y axis) direction orthogonal to the z-axis (x axis) to generate a second transformed representation of the three dimensional volume (column 10 lines 30-37 note the second transformed representation is the representation created by the y z plane decomposition). Wherein the transforming in two dimensions comprises performing at least one level of wavelet decomposition (column 10 lines 36 and 37)

15. Li does not disclose also performing differential pulse code modulation with the wavelet transform in x-axis and Y axis direction. Gu discloses DPCM with the wavelet transform in x-axis and Y axis direction (column 14 lines 15-20.) The motivation to combine is “encode these signals with the lowest possible bit rate” (column 1 lines 50-55)

16. Re claim 13 Li discloses wherein transforming in one dimension (one axis column 10 line32) further comprises performing at least one level of wavelet decomposition (column 10 line 32).

17. Re claim 14 Li discloses wherein transforming in one dimension (plane column 10 line 33) further comprises performing at least one level of wavelet decomposition (column 10 line33).

18. Re claim 15 Li further discloses performing entropy encoding (figure 3 element 308) of at least one of the group consisting of the first transformed representation and the second transformed representation (note entropy encoding is preformed on the 3-d wavelet transformed image)

19. Re claim 16 Li further discloses wherein performing entropy encoding further comprises Huffman encoding (column 14 line 1).

20. Re claim 18 Li further discloses further comprising generating a data stream comprising information for progressively(column 17 lines 5-10) reconstructing the second transformed representation (the horizontal and vertical reconstruction column 19 lines 20-35), followed by information for progressively reconstructing the first transformed representation (column reconstruction lines 30-35).

21. .

22. Re claim 22, Claim 22 is a computer processor configured to perform the method of claim 1. Li further discloses performing his method on a computer (see figure 1). Therefore claim 22 is likewise rejected see rejection of claim 1

23. Claim 3, 20, 21 rejected under 35 U.S.C. 103(a) as being unpatentable over Li, Gu, and Dekel US 2003/0005140.

24. Re claim 3 Li further discloses providing the axially transformed representation to a viewer (note the representation is decompressed and displayed see abstract and figure 1). Li does not disclose progressively providing the reconstruction data)to allow reconstruction of the group at the first axial resolution.

25. Dekel discloses progressively providing the reconstruction data (ROI data paragraph 12) to allow reconstruction of the group at the first axial resolution (lossless quality paragraph 12 and 13). The motivation to combine Dekel is to do "lossless progressive streaming of 3-d images over the internet of speed and quality unknown in the prior art" see paragraph 12. Therefore it would be obvious to combine Li with Dekel to reach the aforementioned advantage.

26. Re claim 20 Li discloses all of the elements of claim 18 Li does not disclose progressively extracting at least a portion of the information (from the data stream according to a desired level of viewing detail of the three dimensional volume. Dekel discloses progressively extracting at least a portion of the information (data blocks paragraph 237) from the data stream according to a desired level of viewing detail (resolution paragraph 237) of the three dimensional volume. The motivation to combine Dekel is to do "lossless progressive streaming of 3-d images over the

internet of speed and quality unknown in the prior art" see paragraph 12. Therefore it would be obvious to combine Li with Dekel to reach the aforementioned advantage.

27. Re claim 21 Li discloses constructing the second transformed representation (the horizontal and vertical reconstruction column 19 lines 20-35), then reconstructing the first transformed representation (column reconstruction lines 30-35). Li does not disclose to achieve a desired level of viewing detail of the three dimensional volume.

28. Dekel discloses to achieve a desired level of viewing detail (resolution paragraph 237) of the three dimensional volume. The motivation to combine Dekel is to do "lossless progressive streaming of 3-d images over the internet of speed and quality unknown in the prior art" see paragraph 12. Therefore it would be obvious to combine Li with Dekel to reach the aforementioned advantage.

29. Claim 17 and 19 rejected under 35 U.S.C. 103(a) as being unpatentable over Li, and Gu in view of common knowledge.

30. Re claim 17 Li and Dekel disclose all of the elements of claim 16 and Huffman encoding. Li does not disclose where Huffman encoding further comprises creating a Huffman look up table. However examiner is taking official notice that it is notoriously well know to use a Huffman look up table when doing Huffman encoding. The motivation is well know as well the advantage is to provide fast, memory efficient Huffman encoding. Therefore it would have been obvious to one of ordinary skill in

the art to combine Li, Dekel and common knowledge in the art to reach the aforementioned advantage

31. Re claim 19 Li and Dekel disclose all the elements of claim 18 they do not disclose wherein the data stream further comprises an entropy decoding table for decoding entropy encoded data. However examiner is taking official notice that it is notoriously well know to include a decoding table in a data stream containing entropy encoded material. The motivation is well know as well the advantage is to provide a decoding table to the recipient of the stream. Therefore it would have been obvious to one of ordinary skill in the art to combine Li, Dekel and common knowledge in the art to reach the aforementioned advantage.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to SEAN MOTSINGER whose telephone number is (571)270-1237. The examiner can normally be reached on 9-5 M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Bhavesh Mehta can be reached on (571)272-7453. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Bhavesh M Mehta/
Supervisory Patent Examiner, Art Unit 2624

Motsinger
4/10/2008